# Transmission Rate Case Risk Analysis Summary

## Background

- Purpose: to estimate whether and to what extent "planned net revenues for risk" (PNRR) are needed in the revenue requirement in order to set rates that support a high probability of BPA repayment of the U.S. Treasury.
- The 2002 Rate Case was the first time a separate risk analysis was performed as part of the transmission rate case.
- BPA's policy on U.S. Treasury payment probability is 95 percent for a two-year rate period. The equivalent financial performance standard for a three-year rate period is 92.7 percent.

## Method

- Proforma Transmission Business Line income and cash flow statements are modeled with Excel.
- The effect of annual net cash flow on end of year cash reserves is estimated; starting with an historical year and forecasting financial results for years prior to the start of the rate period of interest and then continuing through the anticipated rate period.
- Aggregate categories of revenues and expenses are modeled as uncertain variables defined by distributions instead of point estimates.
- Distributions are based primarily on historical variations in revenue and expense data.
- The @RISK add-in for Excel is needed to use the TBL financial risk model in a Monte Carlo simulation mode.
- In each simulation game successful payment of the U.S. Treasury is modeled if the TBL has end of year reserve levels of at least $20 million for working capital requirements. Successful U.S. Treasury payment for the rate period requires successful payment in all years of the rate period.
- Monte Carlo simulations of 5000 games are run to estimate the probability of U.S. Treasury payment during the rate period.
- An iterative process of successive simulation runs and changes in PNRR input assumptions is employed to find the amount of PNRR necessary to achieve the high probability of U.S. Treasury payment during the rate period.

## Changes

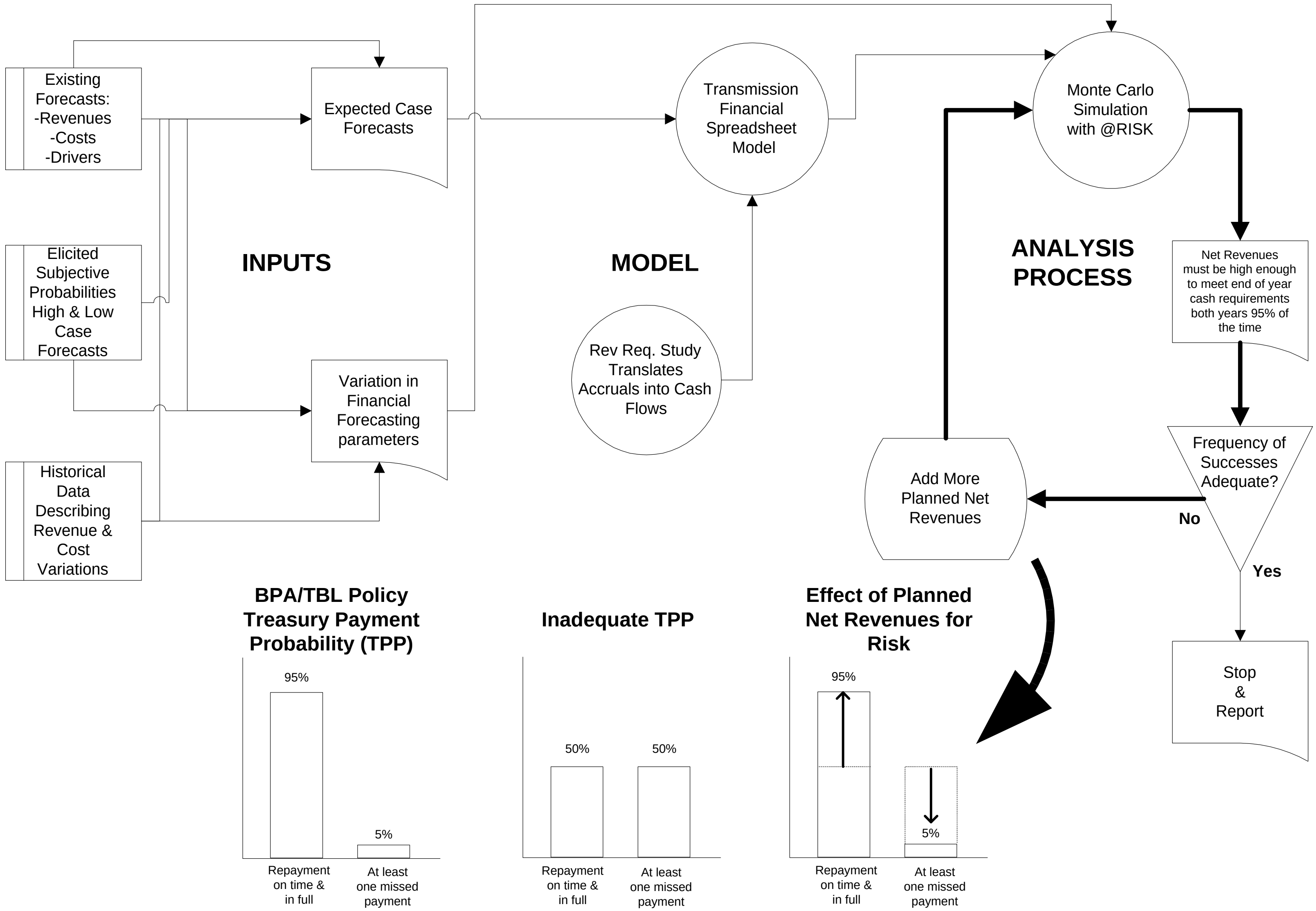
- One, two and three year rate periods can be analyzed
- Short-term firm revenues for the Intertie and Network segments are forecasted separately from long-term firm transmission revenues
- NT (load based) Network revenues are forecasted separately from an aggregate revenue category called Network Take or Pay revenues (Network PTP, IR, FPT)

- Distributions for revenue categories were re-estimated with historical monthly revenue data from 1998 through August of 2002; again using the bootstrap resampling methodology.

**Assumptions/Caveats**

- The proforma TBL Statement of Cash Flows showing actual accumulated TBL contributions to Agency cash reserves in 2001 and 2002 will be available to mitigate TBL's financial risks during the rate period.
- The revenue forecast in the results presented is a hypothetical forecast with the underlying assumption that the expected revenue forecast will equal the expected revenue requirement forecast and the distribution of total revenue among revenue categories will follow existing patterns observed today.
- Setting PNRR requirements to ensure a high probability of meeting minimum working capital requirements for TBL is sufficient for meeting TBL's responsibility for BPA's U.S. Treasury payment probability standard.

# TBL Rate Case Risk Analysis - Flow Diagram



# Preliminary Results – For Discussion Purposes Only

## TABLE 9.6: Statement of Revenues and Expenses - Transmission Business

| | ($ millions) | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| | **Operating Revenues** | (Actuals) | | | | | |
| 1. | Transmission Revenues | 506.8 | 494.0 | 512.5 | 539.2 | 547.1 | 561.1 |
| 2. | Ancillary Services Revenues | 65.0 | 125.3 | 127.9 | 133.1 | 134.9 | 138.4 |
| 3. | Delivery Segment Revenues | 11.3 | 9.9 | 9.6 | 7.5 | 7.7 | 7.9 |
| 4. | Fiber & PCS Revenues | 18.0 | 18.1 | 18.0 | 18.8 | 21.1 | 25.8 |
| 5. | TBL Services Revenues | 10.6 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 6. | Other Revenues & Credits | 35.0 | 38.9 | 28.4 | 33.7 | 34.8 | 35.9 |
| 7. | **Total Operating Revenues** | **646.7** | **701.2** | **711.4** | **747.3** | **760.6** | **784.1** |
| | | | | | | | |
| | **Operating Expenses** | | | | | | |
| 8. | Transmission G&A | 17.2 | 16.1 | 16.5 | 22.4 | 23.0 | 23.6 |
| | CSRS Pension Expense | 4.0 | 27.6 | 17.6 | 15.5 | 13.3 | 11.6 |
| 9. | Transmission Marketing and Scheduling | 10.7 | 13.6 | 14.0 | 14.8 | 15.2 | 15.6 |
| | Transmission Scheduling | 5.3 | 7.8 | 7.9 | 8.6 | 8.8 | 9.0 |
| 10. | Transmission System Operations | 30.9 | 34.8 | 35.7 | 40.1 | 41.1 | 42.1 |
| 11. | Transmission System Maintenance | 67.1 | 80.9 | 82.9 | 87.5 | 89.7 | 92.0 |
| 12. | Transmission System Development | 12.2 | 13.0 | 13.4 | 13.7 | 14.1 | 14.4 |
| | Wheeling/Leases | 0.0 | 5.7 | 5.9 | 5.9 | 6.0 | 6.2 |
| 13. | Environment | 4.6 | 4.4 | 4.5 | 4.5 | 4.6 | 4.7 |
| 14. | Transmission Support Services | 13.2 | 14.6 | 15.0 | 19.4 | 19.8 | 20.3 |
| | TBL Services Expenses | 10.6 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| | | | | | | | |
| | Between Business Line Expenses | 63.4 | 76.5 | 77.3 | 77.3 | 77.3 | 77.3 |
| | | | | | | | |
| 15. | Corporate Expenses | 43.7 | 56.0 | 59.7 | 61.5 | 64.0 | 62.7 |
| 16. | | | | | | | |
| 19. | **Total Transmission Operating Expense** | **282.9** | **366.1** | **365.4** | **386.1** | **391.9** | **394.4** |
| | | | | | | | |
| 20. | **Net Operating Margin** | **363.8** | **335.2** | **346.1** | **361.2** | **368.7** | **389.7** |
| | | | | | | | |
| 21. | Federal Projects Depreciation | 154.9 | 158.3 | 164.7 | 177.9 | 191.3 | 204.1 |
| | | | | | | | |
| 22. | **Total Operating Expense & Depreciation** | **437.7** | **524.4** | **530.0** | **564.0** | **583.1** | **598.6** |
| | | | | | | | |
| 23. | **Net Operating Revenue** | **208.9** | **176.9** | **181.4** | **183.3** | **177.5** | **185.5** |
| | | | | | | | |
| | Interest Expense | | | | | | |
| 24. | Interest on Appropriated Funds | 71.6 | 0.0 | 0.0 | 63.5 | 61.4 | 61.4 |
| 25. | Interest on Long-Term Debt Issued to Treasury | 122.9 | 173.2 | 198.4 | 163.7 | 178.2 | 193.7 |
| 26. | Interest Credit on Cash Reserves | | | (9.9) | (18.2) | (18.1) | (18.7) |
| 27. | Amortization of Capitalized Bond Premiums | | | 3.9 | 3.9 | 3.5 | 3.2 |
| 28. | Capitalization Adjustment | (20.1) | 0.0 | (20.2) | (19.7) | (20.1) | (20.1) |
| 29. | AFUDC | (8.9) | (14.0) | (16.6) | (25.4) | (26.9) | (27.0) |
| | | | | | | | |
| 30. | Net Interest Expense | 165.4 | 159.2 | 155.7 | 167.8 | 177.9 | 192.5 |
| | | | | | | | |
| 31. | **Total Operating & Net Interest Expenses** | **603.1** | **683.6** | **685.7** | **731.8** | **761.0** | **791.0** |
| | | | | | | | |
| 32. | **Net Revenues** | **43.5** | **17.7** | **25.7** | **15.5** | **(0.4)** | **(6.9)** |

### TABLE 9.7: Statement of Cash Flows - Transmission Business

| | ($ millions) | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| | **Cash Provided by Current Operations** | (Actuals) | | | | | |
| 1. | Net Revenues | 43.5 | 17.7 | 25.7 | 15.5 | (0.4) | (6.9) |
| | Expenses not Requiring Cash | | | | | | |
| 2. | Depreciation/Amortization | 154.9 | 158.3 | 164.7 | 177.9 | 191.3 | 204.1 |
| 3. | Amort of Capitalized Bond Premiums | 3.9 | 3.9 | 3.9 | 3.9 | 3.5 | 3.2 |
| 4. | Capitalization Adjustment | (20.1) | 0.0 | (20.2) | (19.7) | (20.1) | (20.1) |
| 5. | Accrual Revenues (AC Intertie & Fiber) | (2.6) | (4.0) | (4.0) | (4.0) | (4.0) | (4.0) |
| 6. | Retained Net Proceeds from Sale of Facilities | 10.4 | | | | | |
| 7. | Clark Settlement | 0.7 | | | | | |
| 8. | Cash Provided by Current Operations | 190.7 | 175.9 | 170.1 | 173.6 | 170.1 | 176.3 |
| | **Cash Used for Capital Investments** | | | | | | |
| | Investment in | | | | | | |
| 9. | Gross Utility Plant and CWIP | (182.7) | (240.3) | (338.9) | (391.6) | (344.5) | (428.3) |
| 10. | Cash Used for Capital Investments | (182.7) | (240.3) | (338.9) | (391.6) | (344.5) | (428.3) |
| | **Cash From Borrowing and Appropriations** | | | | | | |
| 11. | Cash from Borrowing & Appropriations | 182.7 | 240.3 | 338.9 | 371.6 | 324.5 | 408.3 |
| 12. | Repayment of Long-term debt | (12.3) | (88.7) | (142.8) | (126.9) | (153.5) | (110.0) |
| 13. | Repayment of Capital Appropriations | (46.8) | (42.9) | 0.0 | (30.4) | (0.0) | (38.6) |
| 14. | Subtotal Cash from Borrowing & Approp | 123.6 | 108.7 | 196.1 | 214.3 | 171.0 | 259.7 |
| 15. | **Annual Change in Cash Balance** | 131.6 | 44.3 | 27.3 | (3.7) | (3.4) | 7.6 |
| 16. | Plus Beginning Cash Balance | 17.3 | 148.9 | 193.2 | 220.5 | 216.8 | 213.4 |
| 17. | Year End Cash Balance | 148.9 | 193.2 | 220.5 | 216.8 | 213.4 | 221.1 |
| 18. | Deferred Borrowing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 19. | Total Reserves | 148.9 | 193.2 | 220.5 | 216.8 | 213.4 | 221.1 |

<table>
<tr><td>20.</td><td>Treasury Payment - Annual (1 = Yes, 0 = No):</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>21.</td><td>Treasury Payment - Rate Period (1 = Yes, 0 = No):</td><td colspan="2">1</td><td colspan="2">1</td><td></td></tr>
<tr><td>22.</td><td>Treasury Payment - 3yr Rate Period (1=Yes, 0=No):</td><td colspan="2"></td><td colspan="3">1</td></tr>
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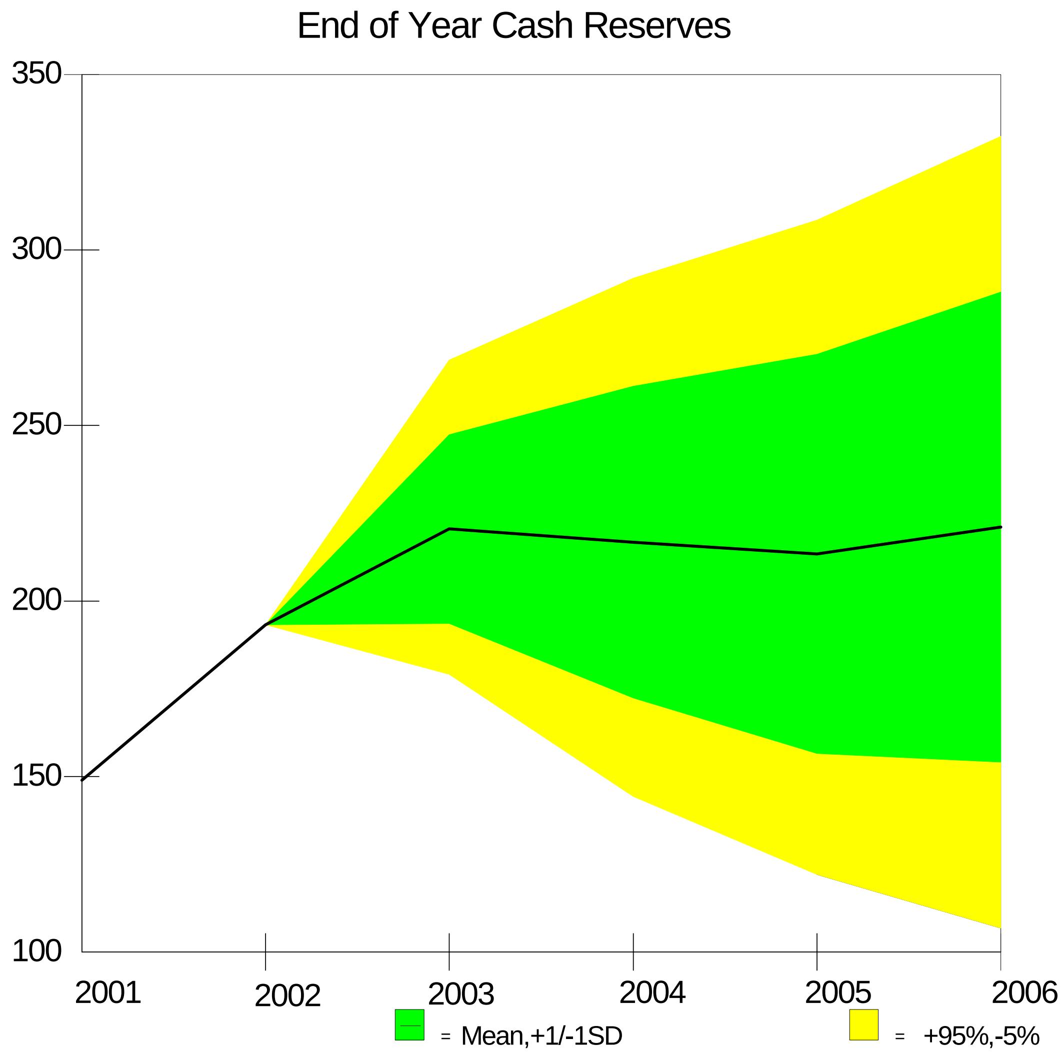
End of Year Cash Reserves
350
300
250
200
150
100
2001
2002
2003
2004
2005
2006
= Mean,+1/-1SD
= +95%,-5%